

Claims

- [c1] A timing circuit comprising:
- a clock generator;
 - a comparator for comparing an inputted control voltage and a reference voltage;
 - a retaining circuit for retaining an output of said comparator;
 - and
 - a circuit for producing timing pulses as an output thereof based on an output of said retaining circuit and clock signals outputted from said clock generator.
- [c2] A timing circuit according to claim 1, wherein said comparator receives a first clock signal outputted from said clock generator and is operated only for a time corresponding to a short pulse width of said first clock signal.
- [c3] A timing circuit according to claim 1, wherein said circuit for producing said timing pulses comprises:
- a counter for receiving the output of said retaining circuit and a first clock signal outputted from said clock generator; and
 - a logic circuit for receiving an output of said counter and a second clock signal outputted from said clock generator.
- [c4] A timing circuit according to claim 3, further comprising a circuit for receiving the output of said retaining circuit and sending a reset signal to said counter.

- [c5] A timing circuit according to claim 1, wherein said comparator comprises:
a first comparator for receiving a first reference voltage and said control voltage; and
a second comparator for receiving a second reference voltage and said control voltage.
- [c6] A timing circuit according to claim 5, wherein said retaining circuit comprises:
a first latch circuit for receiving an output of said first comparator; and
a second latch circuit for receiving an output of said second comparator.
- [c7] A timing circuit according to claim 3, wherein said logic circuit comprises an AND circuit.
- [c8] A timing circuit for producing clocks variable depending on a temperature, said timing circuit comprising a detection circuit that can detect the temperature at a predetermined sampling period, wherein said detection circuit is operated only for a time corresponding to a short pulse width of a clock signal that changes its level at said sampling period, thereby to detect the temperature.
- [c9] A timing circuit for controlling a refresh period of a DRAM depending a temperature, said timing circuit comprising a

detection circuit that can detect the temperature at a predetermined sampling period, wherein said detection circuit is operated only for a time corresponding to a short pulse width of a clock signal that changes its level at said sampling period, thereby to detect the temperature.

[c10] A timing circuit according to claim 9, wherein said sampling period is a period determined by $T \times n$ where T represents a refresh period required at the maximum operating temperature of the DRAM and n represents an arbitrary natural number.

[c11] A method for changing a clock period, comprising:
(a) a step of preparing a reference clock signal;
(b) a step of detecting a temperature at a predetermined sampling period; and
(c) a step of changing a period of said reference clock signal depending on said detected temperature.

[c12] A method according to claim 11, wherein said step (b) comprises a step of detecting a temperature only for a time corresponding to a short pulse width of a clock signal that changes its level at said sampling period.

[c13] A method according to claim 11, wherein said step (c) comprises a step of producing a clock signal having a longer period by increasing the number of pulses decimated from said reference clock signal depending on dropping of said

detected temperature.

- [c14] A method according to claim 11, wherein said sampling period is a period determined by $T \times n$ where T represents the period of said reference clock signal and n represents an arbitrary natural number, and said natural number n is set to a large value when the changing speed of the temperature is slow, and to a small value when the changing speed of the temperature is fast.